CLAIMS

1. A method for packaging a microelectronic substrate, comprising:

positioning a conductive member at least proximate to the microelectronic substrate, the conductive member having first and second neighboring conductive portions with at least part of the first conductive portion separated from the neighboring second conductive portion to define an intermediate region between the conductive portions;

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electrically coupling the first conductive portion of the conductive member to a first coupling site of the microelectronic substrate and electrically coupling the second conductive portion of the conductive member to a second coupling site of the microelectronic substrate; and

providing a dielectric material in the intermediate region between the conductive portions, the dielectric material having a dielectric constant less than about 3.5.

2. The method of claim 1 wherein the conductive portions each have a first surface adjacent to the microelectronic substrate, a second surface facing opposite the first surface, and a third surface between the first and second surfaces, and wherein the method further comprises providing the dielectric material adjacent to the third surfaces of the conductive portions.

3. The method of claim 1 wherein the conductive portions each have a first surface adjacent to the microelectronic substrate, a second surface facing opposite the first surface, and a third surface between the first and second surfaces, and wherein the method further comprises disposing the dielectric material on the second surfaces of the conductive portions and applying a force normal to the second surface to displace at least some of the dielectric material into the intermediate region between the conductive portions adjacent to the third surfaces of the conductive portions.

4. The method of claim 1 wherein positioning the conductive member includes positioning a leadframe adjacent to the microelectronic substrate, and wherein the

method further comprises providing the dielectric material between neighboring leadfingers of the leadframe.

5. The method of claim 1 wherein positioning the conductive member includes positioning adjacent to the microelectronic substrate a printed circuit board having conductive traces, and wherein the method further comprises providing the dielectric material between the conductive traces of the printed circuit board.

6. The method of claim 1, further comprising adhering a layer of the dielectric material to the conductive member.

7. The method of claim 1, further comprising:

disposing the dielectric material on the conductive member; and

applying heat and/or pressure to the dielectric material after disposing the dielectric material on the conductive member.

8. The method of claim 1, further comprising disposing the dielectric material on the conductive member in a liquid or vapor phase.

9. The method of claim 1 wherein electrically coupling the conductive portions of the conductive member to coupling sites of the microelectronic substrate includes attaching wire bonds between the conductive portions of the conductive member and bond pads of the microelectronic substrate.

10. The method of claim 1, further comprising disposing an encapsulating material over at least part of the conductive member and the microelectronic substrate.

11. The method of claim 1, further comprising selecting the dielectric constant of the dielectric material to be from about 1.0 to about 2.0.

12. The method of claim 1, further comprising selecting the dielectric material to include Teflon™.

13. A method for processing a circuit board for coupling to a microelectronic substrate, comprising:

providing a circuit board having a first conductive trace with a portion spaced apart from a corresponding portion of a second conductive trace to define an intermediate region between the first and second conductive traces; and

disposing in the intermediate region between the conductive traces a dielectric material having a dielectric constant less than approximately 3.5.

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14. The method of claim 13, further comprising selecting the dielectric material to have a dielectric constant of from about 1.0 to about 2.0.

15. The method of claim 13, further comprising selecting the dielectric material to include a gas.

16. The method of claim 13, further comprising selecting the dielectric material to include gas, argon and/or helium.

17. The method of claim 13 wherein the conductive traces each have a first surface, a second surface facing opposite the first surface, and a third surface between the first and second surfaces with the third surface of the first conductive trace facing the third surface of the second conductive trace, and wherein the method further comprises disposing the dielectric material on the second surfaces of the conductive traces and applying a force normal to the second surfaces to displace at least some of the dielectric material into the intermediate region between the conductive traces adjacent to the third surfaces of the conductive traces.

18. The method of claim 13 wherein disposing the dielectric material includes adhering a layer of the dielectric material to the conductive member.

19. The method of claim 13, further comprising applying heat and/or pressure to the dielectric material after disposing the dielectric material on the conductive traces.

20. The method of claim 14 wherein disposing the dielectric material includes disposing the dielectric material in liquid or vapor phase.

21. A method for processing a leadframe for coupling to microelectronic substrates, comprising:

providing a leadframe having first and second connected leadfingers, at least a portion of the first leadfinger being separated from a neighboring portion of the second leadfinger, each leadfinger having a first surface, a second surface opposite the first surface, and a third surface between the first and second surfaces, the second surface having a bond site for receiving wire bonds; and

applying to the leadframe a dielectric material having a dielectric constant of less than about 3.5, the dielectric material being positioned adjacent to the third surfaces of the leadfingers and/or proximate to the third surfaces to extend between the third surfaces of the first and second leadfingers when the leadframe is connected to a microelectronic substrate.

22. The method of claim 21 wherein disposing the dielectric material includes disposing a pliable dielectric material on at least one of the first and second surfaces adjacent to the third surface.

23. The method of claim 21 wherein disposing the dielectric material includes disposing a first dielectric material on one of the surfaces of the leadfingers, further comprising disposing a second dielectric material different than the first dielectric material on another surface of the leadfingers.

24. The method of claim 21 wherein disposing the dielectric material includes disposing a pliable dielectric material on at least one of the first and second surfaces

adjacent to the third surface, and wherein the method further comprises applying a normal force to the at least one of the first and second surfaces to displace a portion of the dielectric material to a point between the third surfaces of the first and second leadfingers.

25. The method of claim 21, further comprising:

attaching a wire bond to the first leadfinger before disposing the dielectric material; and

disposing the dielectric material on the wire bond.

26. The method of claim 21, further comprising completely filling in a region between the third surface of the first leadfinger and the third surface of the neighboring second leadfinger.

27. The method of claim 21 wherein disposing the dielectric material includes dipping the leadframe into a volume of the dielectric material.

28. The method of claim 21 wherein disposing the dielectric material includes disposing the dielectric material in liquid or vapor phase.

29. A method for packaging a microelectronic substrate, comprising:

positioning leadfingers of a leadframe adjacent to corresponding bond sites of the microelectronic substrate;

electrically coupling the leadfingers to the bond sites;

disposing a first dielectric material adjacent to first surfaces of the leadfingers and the microelectronic substrate;

disposing a second dielectric material adjacent to second surfaces of the leadfingers facing opposite the first surfaces; and

introducing at least some of the first and/or second dielectric material into a gap between adjacent leadfingers by biasing the leadframe toward the microelectronic substrate and/or applying heat to at least one of the dielectric materials.

30. The method of claim 29 wherein biasing the leadframe includes applying a normal force to the at least one of the first and second surfaces of the leadfingers.

31. The method of claim 29 wherein disposing the first dielectric material includes adhering a layer of the first dielectric material adjacent to the first surfaces of the leadfingers.

32. The method of claim 29 wherein disposing the first dielectric material includes applying a layer of adhesive to the first dielectric material and adhering the adhesive layer to the microelectronic substrate.

33. The method of claim 29 wherein disposing the first dielectric material includes depositing particles of the first dielectric material to form a layer of the first dielectric material.

34. The method of claim 29, further comprising:

removing a portion of the second dielectric material from the second surface of each leadfinger to expose a portion of the second surface of each leadfinger; and

attaching wire bonds between the exposed portions of the leadfingers and the bond pads.

35. The method of claim 29, further comprising:

leaving portions of the second surfaces of the leadfingers uncovered by the second dielectric material; and

attaching wire bonds between the bond sites of the microelectronic substrate and the uncovered portions of the leadfingers.

36. The method of claim 29 further comprising selecting the first and second dielectric materials to have approximately the same dielectric constant.

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37. The method of claim 29, further comprising:

disposing an encapsulating material adjacent to the leadframe and the microelectronic substrate; and

selecting at least one of the first and second dielectric materials to have a dielectric constant less than a dielectric constant of the encapsulating material.

38. The method of claim 29, further comprising selecting at least one of the first and second the dielectric materials to have a dielectric constant less than about 3.5.

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39. The method of claim 29, further comprising selecting the first dielectric material to have a dielectric constant of from about 1.0 and to about 2.0.

40. A conductive structure for coupling to a microelectronic substrate, comprising:

a conductive member having first and second conductive portions, at least a part of the first conductive portion being spaced apart from a neighboring part of the second conductive portion to define an intermediate region between the first and second conductive portions, each conductive portion having a bond region positioned to electrically couple to a microelectronic substrate when the conductive member is positioned at least proximate to the microelectronic substrate; and

a dielectric material adjacent to the first and second conductive portions, the dielectric material having a dielectric constant less than about 3.5.

41. The conductive structure of claim 40 wherein the conductive member includes a leadframe, the first conductive portion includes a first leadfinger of the leadframe and the second conductive member includes second leadfinger connected to the first leadfinger.

42. The conductive structure of claim 40 wherein the conductive member includes an assembly of conductive traces, the first conductive portion includes a first conductive trace and the second conductive portion includes a second conductive trace with

at least a portion of the first trace spaced apart from a portion of the second trace, and wherein the conductive structure further comprises a printed circuit board supporting the first conductive trace relative to the second conductive trace.

43. The conductive structure of claim 40 wherein the conductive portions each have a first surface, a second surface facing opposite the first surface, and a third surface between the first and second surfaces, and wherein the dielectric material is adjacent to the third surfaces of the conductive portions.

44. The conductive structure of claim 40 wherein the conductive portions each have a first surface, a second surface facing opposite the first surface, and a third surface between the first and second surfaces, and wherein the dielectric material includes a pliable dielectric material disposed at a position on the second surfaces of the conductive portions proximate to the third surfaces.

45. The conductive structure of claim 40 wherein the dielectric material includes a thermoset material.

46. The conductive structure of claim 40 wherein the conductive portions each have a first surface, a second surface facing opposite the first surface, and a third surface between the first and second surfaces, and wherein the dielectric material is a first dielectric material adjacent one of surfaces of the conductive portions, and wherein the conductive structure further includes a second dielectric material different than the first dielectric material adjacent to another of the surfaces.

47. The conductive structure of claim 40 wherein the dielectric material is adhesively attached to the conductive member.

48. The conductive structure of claim 40 wherein the dielectric material includes a gas.

49. The conductive structure of claim 40 wherein the dielectric material includes air, argon and/or helium.

50. A microelectronic device package, comprising:

a microelectronic substrate;

a conductive member at least proximate to the microelectronic substrate, the conductive member having first and second conductive portions, at least a part of the first conductive portion being spaced apart from a neighboring part of the second conductive portion, each conductive portion having a bond region proximate to the microelectronic substrate;

a first conductive connector connected between the microelectronic substrate and the bond region of the first conductive portion;

a second conductive connector connected between the microelectronic substrate and the bond region of the second conductive portion; and

a dielectric material between the first and second conductive portions, the dielectric material having a dielectric constant less than about 3.5.

51. The package of claim 50, further comprising an encapsulating material adjacent to the microelectronic substrate and the conductive member.

52. The package of claim 50 wherein the dielectric material is a first dielectric material, and wherein the package further comprises a second dielectric material at least partially encapsulating the microelectronic substrate, the conductive member, and the conductive connectors and having a chemical composition generally the same as a chemical composition of the first dielectric material.

53. The package of claim 50, further comprising an encapsulating material adjacent to the microelectronic substrate and having a dielectric constant greater than the dielectric constant of the dielectric material.

54. The package of claim 50 wherein the dielectric material includes a gas.

55. The package of claim 50 wherein the first conductive connector includes a first wire bond and the second conductive connector includes a second wire bond.

56. The package of claim 50 wherein the first and second conductive portions define an intermediate region therebetween and the dielectric material fills the entire intermediate region.

57. A microelectronic device package, comprising:

a microelectronic substrate having a first face, a second face facing opposite the first face, and a plurality of terminals at the first face;

a leadframe positioned adjacent to the first surface, the leadframe having a plurality of leadfingers, each leadfinger having a first portion coupled to the leadframe and a second portion spaced apart from an adjacent leadfinger; each leadfinger having a first surface facing toward the first face of the microelectronic substrate, a second surface facing opposite the first surface, and a third surface between the first and second surfaces;

a dielectric material having a first dielectric constant and being disposed adjacent to the leadframe, the dielectric material being engaged with the first, second and third surfaces of the leadfingers; and

an encapsulating material at least partially surrounding the leadfingers and the microelectronic substrate, the encapsulating material having a second dielectric constant higher than the first dielectric constant.

58. The package of claim 57, further comprising an adhesive between the leadfinger and the dielectric material to secure the dielectric material to the leadfinger.

59. The package of claim 57 wherein the first dielectric constant of the dielectric material is less than about 3.5.

60. The package of claim 57 wherein the first dielectric constant of the dielectric material is from about 1.0 to about 2.0.

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